Table 10. Assessment Methods for the Estuarine Community

Assessment Variable	Assessment Criteria	Species/Life Stage	Assessment Method	Meets Constraint		
				1	2	3
Delta flow	Habitat area (**EET**)	Splittail/spawning	Relationship between flow and flooded habitat area in the Delta and Suisun Bay for February through March	Maybe	No	Yes
	Habitat area (**EET**)	*Delta smelt/juvenile, *striped bass/juvenile, *longfin smelt/larvae, Asian clam	Relationship between salinity and area of habitat meeting the optimal salinity needs for the species (Unger 1994)	Yes	Maybe	Yes
	Population abundance	Striped bass/adult	A model for projection of striped bass abundance in terms of flows and diversions (Botsford and Brittnacher 1994)	Yes	No	Maybe
	Abundance index (**EET**)	Striped bass/juvenile, *longfin smelt/juvenile, *splittail/juvenile, Chinook salmon/juvenile, American shad/juvenile	Relationship between Delta inflow or outflow and abundance indices (California Department of Fish and Game 1992a, 1992b, and 1992c; Stevens and Miller 1983)	Yes	Maybe	Yes
	Abundance index	Delta smelt/juvenile	Relationship between the abundance index and the proportion of time that X2 is located in Suisun Bay (Herbold 1994)	Maybe	No	Maybe
	Abundance index, survival, or particulate organic carbon (POC)(**EET**)	Striped bass/juvenile, *longfin smelt/juvenile, *mysid shrimp, estuarine productivity	Relationship between the abundance index (or survival or POC) and X2 (San Francisco Estuary Project 1993)	Yes	Maybe	Yes

Table 10. Continued

Assessment Variable	Assessment Criteria	Species/Life Stage	Assessment Method	Meets Constraint		
				1	2	3
Delta flow	Survival and abundance	Chinook salmon/smolt	Relationship between flow (as estimated at Rio Vista) and smolt abundance and survival (San Francisco Estuary Project 1992)	Yes	No	Maybe
	Residence time (EET)	*Copepods, *rotifers, *ecosystem productivity	Relationship between flow and residence time for a particle in a specific location of the Delta or Suisun Bay (hydrodynamic models)	Yes	Maybe	Maybe
	Distribution	*Asian clam	Relationship between high Delta outflow and upstream extent of population (IEP 1996)	Maybe	Maybe	Yes
	Adult escapement	Chinook salmon/adult	Relationship between river inflow and escapement in the San Joaquin River basin and other rivers (Speed 1993, U.S. Fish and Wildlife Service 1995)	Maybe	No	Yes
	Proportion of flow	*Chinook salmon/adult	Proportion of San Joaquin River or Mokelumne River flow exiting the Delta (hydrodynamic model)	Yes	Maybe	Yes
	Survival	Chinook salmon/juvenile	Relationship between survival and the combined effects of channel flows, export, flow divisions, and temperature (Kjelson et al. 1989, U.S. Environmental Protection Agency 1994)	Yes	No	Maybe

Table 10. Continued

Assessment Variable	Assessment Criteria	Species/Life Stage	Assessment Method	Meets Constraint		
				1	2	3
Delta flow	Survival (EET)	*Chinook salmon/juvenile	Relationship between survival and water temperature (Kjelson et al. 1989, U.S. Fish and Wildlife Service 1993)	Yes	Yes	Yes
	Dissolved oxygen	*Chinook salmon/adult, juvenile	Relationship between channel flow and dissolved oxygen levels	Maybe	Maybe	Yes
	Transport rate	*All	Rate of movement of particles (toxins, fish larvae) out of the Delta and Suisun Bay (hydrodynamic model)	Maybe	Maybe	Maybe
Water quality	Toxic load (EET)	*All	Change in toxic load, pesticide use data, industrial and municipal discharge data	Yes	Yes	Maybe
Temperature	Survival (EET)	Chinook salmon/juvenile	See "Flow"			
Sediment movement	None proposed					
Diversion impacts	Proportion of flow diverted	All	The ratio of diversion volume to inflow volume	Yes	Yes	No
	Transport rate	*All	Rate of movement of particles (e.g., water from a specific source, fish larvae) to exports and Delta diversions (hydrodynamic model)	Maybe	Maybe	Maybe
	Exposure ratio (EET)	*All	Proportional distribution of a species relative to the proportional distribution of diversions (i.e., diversion location)	Maybe	Maybe	Yes

Table 10. Continued

Assessment Variable	Assessment Criteria	Species/Life Stage	Assessment Method	Meets Constraint		
				1	2	3
Diversion impacts	Proportion of screened diversions (**EET**)	*All screenable species/ life stages	Ratio of number of screened diversions over total number of diversions	Yes	Yes	Yes
Barriers	Proportion of flow	*Chinook salmon/juvenile, adult; *American shad/juvenile	The ratio of flow moving along an adverse pathway (e.g., DCC) to total flow (e.g., Sacramento River)	Yes	Yes	Yes
	Proportion of fish	Chinook salmon/juvenile	The ratio of the number of fish moving along an adverse pathway relative to the total number of fish (e.g., acoustic barrier)	Maybe	No	Yes
	Survival	Chinook salmon/juvenile	See "Flow"			
Habitat	Habitat area (**EET**)	*All, including productivity	Area of habitat restoration meeting specific criteria (e.g., based on species needs) relative to area of existing habitat that meets the same criteria	Maybe	Maybe	Maybe
	Habitat area (**EET**)	Splittail/spawning, *delta smelt/juvenile, *striped bass/juvenile, *longfin smelt/larvae	See "Flow"			
Fishing	None proposed					
Artificial production	None proposed					
Species interaction	Residence time (**EET**)	Copepods, rotifers, ecosystem productivity	See "Flow"			
Species interaction	Daily mortality rate, growth	Striped bass/larvae	Correlation between food abundance and mortality	Yes	No	Maybe

Table 10. Continued

Assessment Variable	Assessment Criteria	Species/Life Stage	Assessment Method	Meets Constraint		
				1	2	3
Species Interaction	Abundance	Delta smelt/eggs, larvae	Relationship between inland silverside abundance and delta smelt abundance	No	No	Maybe

Notes:

An asterisk (*) indicates that the assessment method, as applied to the species and life stage identified, may be included among the tools used for the impact assessment in the Programmatic EIR/EIS.

EET - The Estuarine Ecology Project Work Team of the Interagency Ecological Program identified these assessment criteria as potentially serving as primary controls of resource abundance.

Under "Meets Constraint", constraints 1, 2, and 3 are discussed in the text and briefly defined as:

1 - The assessment criteria must be measurable.

2 - The measurement error of the assessment criteria must be lower than the range of differences among alternatives.

3 - The assessment criteria must make it possible to identify important differences and similarities between alternatives.